BAB XII

PERHITUNGAN PONDASI TELAPAK PT

12.1 Beban yang Bekerja (ETABS)

$Pu := 8736.44 \quad kg$

12.2 Kontrol dimensi pondasi

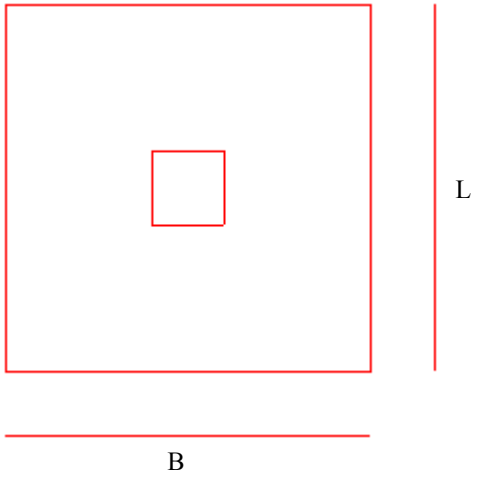
Dimensi pondasi

$B := 120 \quad cm \qquad L := 120 \quad cm$

$A := B \cdot L = 14400 \quad cm^2$

$Wx := \frac{B \cdot L^2}{6} = 288000 \quad cm^3$

$Wy := \frac{L \cdot B^2}{6} = 288000 \quad cm^3$



Tegangan yang terjadi

$\sigma max := \frac{Pu}{A} = 0.607 \quad kg/cm^2$

Tegangan ijin tanah (data sondir kedalaman 1.5 m)

$qc := 4 \quad kg/cm^2$

$SF := 3$

$qijin := \frac{qc}{SF} = 1.333 \quad kg/cm^2 \quad > \quad \sigma max = 0.607 \quad kg/cm^2 \quad OK!!$

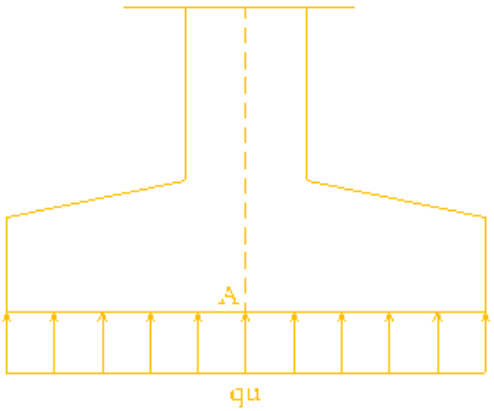
12.3 Penulangan Pondasi telapak

Momen pada pondasi (momen pada POT. A) :

$qu := \sigma max \cdot 1000 = 606.697 \quad kg/m$

$Mp := \frac{qu \cdot 1.2^2}{2} = 436.822 \quad kgm$

$Mult := 1.2 \cdot Mp = 524.186 \quad kgm$



Adapun data - data perencanaan untuk penulangan pondasi :

- Tebal pelat : $h := 350 \quad mm$
- Tebal decking $s := 50 \quad mm$
- Diameter tulangan rencana D13

- Mutu tulangan baja $fy := 390 \quad Mpa$
- Mutu beton $fc := 18.675 \quad Mpa$

$daksen := 50 + 6.5 = 56.5 \quad mm$

$d := h - daksen = 293.5 \quad mm$

$b := 1200 \quad mm$

$\beta := 0.85$

Berdasarkan SNI 2847 pasal 10.4.3 :

$$\rho balance := \frac{0.85 \cdot \beta \cdot fc \cdot \left(\frac{600}{600 + fy} \right)}{fy} = 0.021$$

$\rho max := 0.75 \cdot \rho balance = 0.016$

Berdasarkan SNI 03-2847-2002 pasal 9.12.2

$$\rho min := \frac{1.4}{fy} = 0.0036$$

$$m := \frac{fy}{0.85 \cdot fc} = 24.569$$

$$Mn := \frac{Mult \cdot 9.81 \cdot 1000}{0.8} = 6427835.73 \quad Nmm$$

$$Rn := \frac{Mn}{b \cdot d^2} = 0.062 \quad N/mm^2$$

$$\rho := \frac{\left(1 - \sqrt{1 - \frac{2m \cdot Rn}{fy}} \right)}{m} = 0.00016$$

$\rho = 0.00016 \quad < \quad \rho min = 0.0036$

$Asperlu := \rho min \cdot b \cdot d = 1021.38 \quad mm^2$

jadi pasang tulangan lentur D13-150

$Aspsg := 9 \cdot 0.785 \cdot 13^2 = 1193.985 \, mm^2$

12.4 Kontrol geser pons

- Beban Aksial Kolom

  Perencanaan penampang akibat geser didasarkan pada beban aksial kolom

  $Nuk := 259.429 \quad kN$

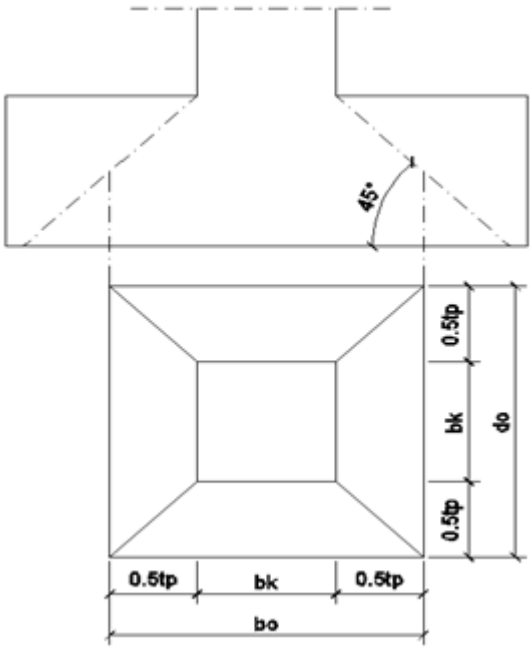
- Dengan persyaratan Vu < Vc (gaya geser ultimate harus lebih kecil dari kuat geser nominalnya).

  tebal pondasi $tp := 35 \quad mm$

  dimensi kolom 35/35 cm

  $bo := 0.5 \cdot tp + 35 + 0.5 \cdot tp = 70 \quad cm$

  $do := 0.5 \cdot tp + 35 + 0.5 \cdot tp = 70 \quad cm$



- Keliling Kritis

  $U := 2 \cdot (bo + do) = 280 \quad cm$

- Luas Kritis

  $Ak := U \cdot tp = 9800 \quad cm^2$

- Kekutan Geser Beton

  $\beta c := \frac{35}{35} = 1$

  $d := tp - 5 - 1.3 = 28.7 \quad cm$

$$Vc := \frac{\sqrt{fc} \cdot U \cdot d \cdot 100 \cdot \left(1 + \frac{\beta c}{2}\right)}{6 \cdot 10^3} = 868.181 \quad kN$$ ..... SNI 2847 pasal 13.12.2.1

Syarat Vu $\leq$ ΦVc

$\phi := 0.75$

$Nuk = 259.429 \quad kN$ ▮ < ▮ $\phi \cdot Vc = 651.136 \quad kN$ ..... OK!!!